

"How to Open and Close the Forward Calorimeter in the CDF Collision Hall"

This procedure outlines the procedure to be used to open and close the East and West Forward Steel in the CDF Collision Hall.

Due to the weight and cost of the Forward Calorimeter, it is required that the head of the Research Division review and approve this moving procedure.

Approvals:

(Safety Committee Head) (Date)

(CDF Department Head) (Date)

(Research Division Head) (Date)

(Accelerator Division Head) (Date)

1.0 Controlled Copies of this procedure.

Two controlled copies of this procedure will exist.

One will be held in the CDF Department Office.

One will be held in the CDF (B-0) Office Complex, Room 171i.

All other copies will be marked, " **INFORMATIONAL COPY ONLY** "

2.0 The Procedure.

STEP 1: Identify Key Personnel and their Responsibilities

2.0.1: Objective: To identify the responsibilities of each individual involved in the movement of the Forward Calorimeter

2.0.2 Responsibilities:

a). **Co-Ordinator:** will oversee the movement operation from a distance great enough to easily see all personnel and equipment involved in the move and to watch for over-head obstructions. He will report any developing or potential problems to the task leader. At no time will the Co-Ordinator take over for the task leader. The Co-Ordinator is there to assist and insure that overall safety is being maintained.

b). **Responsible Engineer:** may be called on to function as the Co-Ordinator. May also be called upon to solve structural / mechanical problems such as: how to move obstacles, or how to cross gaps in the floor. He will be a structural or mechanical engineer designated by CDF.

c). **Task Leader:** will insure that all personnel under his direction have performed their checks of the equipment and will insure that the equipment is installed properly. He will make certain that his personnel are located in their designated areas before the move begins (to include the Co-Ordinator or the Responsible Engineer). He will specify who will operate the equipment such as the hydraulic pump. He will move freely in the work area to insure that the movement of the Forward Calorimeter is slow and completely controlled. His directions will be followed completely and therefore he becomes responsible for the personnel and equipment involved during the move. **NO** movement of the Forward Calorimeter will be conducted without his presence.

d). **Workers:** will install all equipment and will insure that the equipment is serviceable and free from defects. They will keep the area clean and free from obstructions. They will set the hydraulic jack and cribbing as necessary to move the Forward Calorimeter and will follow all directions from the Task Leader.

e). **Hydraulic Pump Operator:** will be designated by the task leader and will be qualified to operate the equipment used to push the Forward Calorimeter. He will follow all directions from the Task Leader.

2.1 Operating Procedures for Moving Forward Calorimeter in North and South Directions.

The following procedures for moving a Forward Calorimeter away from the beam pipe and toward the beam pipe, will be followed with the strictest adherence to each step and will be verified by the Task Leader

STEP 2: Area Preparation

CAUTION! Rolling the Forward Calorimeter over loose debris could cause the Hillman Rollers to bind or stop suddenly. This could cause damage to the Hillman Rollers and Experimental Equipment..

2.1.1 Objective: To provide a safe working environment for the safety of the personnel as well as the Forward Calorimeter.

2.1.2 Procedure: The area in which the Forward Calorimeter will be moved, will have all obstacles moved clear of the area and will have the floor completely swept of debris. During the move, the workers will continuously verify that no objects are lying in the movement area. All over-head obstacles will be cleared from the area.

STEP 3: Key Equipment/Inspection of Equipment

2.1.3 Objective: To maintain proper performance of equipment for serviceability and safety.

2.1.4 Equipment:

a). Hydraulic Pump: will be inspected for leaks, cracks or other defects. All surfaces will be cleared of all debris. The Task Leader will designate, from the list of trained people, who will check and operate this equipment.

b). Hillman Rollers: will be free from defects and will roll easily.

c). Push / Pull Hydraulic Cylinders: will be inspected for leaks, cracks or other defects. The Task Leader will designate, from the list of trained people, who will check and operate this equipment.

STEP 4: Placement of Equipment / Personnel

NOTE: While conducting the move, all directions will be given ONLY by the Task Leader.

2.1.5 Objective: To position equipment / personnel to properly and safely move the Forward Calorimeter

2.1.6 Equipment / Personnel

- a). The Hydraulic Pump Operator should always be in eye or voice contact with the Task Leader.
- b). The workers will be positioned so that they can identify problems with the Hillman Rollers, the hydraulic push / pull jack, cribbing and be able to confirm all overhead clearances.
- c). The Task Leader is free to move around the work area to supervise and give instructions.
- d). The Co-Ordinator will stay at such a distance to allow himself a clear view of all workers and the entire Forward Calorimeter. Overall safety is his key concern. To avoid confusion among the workers, the Co-Ordinator communicates to the Task Leader only.

NOTE: Use either 2.2 "Opening Procedure," or 2.3 "Closing Procedure."

2.2 Opening Procedure.

STEP 5: Points to check before beginning Forward Calorimeter move

2.2.1: Objective: To insure that Forward Calorimeter is ready to move.

2.2.2 Complete Checklist under 3.0. To be completed by Co-Ordinator.

WARNING! These items **MUST** be checked and confirmed before any moving operation is performed on the Forward Calorimeter.

STEP 6: Confirming position of Hillman Rollers

2.2.3 Objective: To confirm alignment of Hillman Rollers for straight movement

2.2.4 Confirming alignment of Hillman Rollers

- a). Confirm that at least one (1) set of Hillman Rollers is parallel to the direction of travel.
- b). Confirm that the distance between side plates of East and West Hillman Rollers is equal.

NOTE! Do **NOT** adjust position of Hillman Rollers after move of Forward Calorimeter has been completed.

STEP 7: Moving one (1) half of Forward Calorimeter away from Beam Pipe

2.2.5 Objective: To reposition a Forward Calorimeter in a slow, controlled manner so that safety to personnel and equipment is maintained.

2.2.6 Procedure to move Forward Calorimeter away from Beam Pipe
a). Set up double-acting hydraulic jack and hardwood blocks to fill space between jacking pad and Forward Calorimeter frame.

b). Remove chocks from under Hillman Rollers.

CAUTION! Be ready to re-install chocks, if necessary.

c). Using hydraulic pump, double-acting hydraulic jack and hardwood blocks as required, push against Forward Calorimeter frame to open Forward Calorimeter.

d). Retract double-acting jack, and fill space between jacking pad and Forward Calorimeter frame with hardwood blocks, as necessary..

e). Repeat steps c and d, as necessary to move Forward Calorimeter to desired position.

f). Install wedges under Hillman Rollers as necessary to prevent movement of Forward Calorimeter halves.

g). Remove, clean and store equipment.

NOTE! Repeat steps a thru f, to open each half of Forward Calorimeter

2.3 Closing Procedure

STEP 5 Points to check before beginning Forward Calorimeter move

2.3.1: Objective: To insure that Forward Calorimeter is ready to move.

2.3.2 Complete Checklist under 3.1. To be completed by the Co-Ordinator.

WARNING! These items **MUST** be checked and confirmed before any moving operation is performed on the Forward Calorimeter.

STEP 6: Setting position of Hillman Rollers

2.3.3 Objective: To align Hillman Rollers for straight movement

2.3.4 Procedure for alignment of Hillman Rollers

- a). Confirm that at least one (1) Hillman Roller is parallel to the direction of travel.
- b). Confirm that the distance between side plates of East and West Hillman Rollers is equal.

STEP 7: Moving one (1) half of Forward Calorimeter toward (Close) the Beam Pipe

2.2.5 Objective: To reposition a Forward Calorimeter in a slow, controlled manner so that safety to personnel and equipment is maintained.

2.2.6 Procedure to move Forward Calorimeter toward the Beam Pipe

- a). Set up double-acting hydraulic jack and hardwood blocks to fill space between jacking pad and Forward Calorimeter frame.
- b). Remove chocks from under Hillman Rollers.
- c). Using hydraulic pump, double-acting hydraulic jack and hardwood blocks as required, push against Forward Calorimeter frame to open Forward Calorimeter.
- d). Retract double-acting jack, and fill space between jacking pad and Forward Calorimeter frame with hardwood blocks, as necessary..
- e). Repeat steps c and d, as necessary to move Forward Calorimeter to desired position.
- f). Install wedges under Hillman Rollers as necessary to prevent movement of Forward Calorimeter halves.
- g). Remove, clean and store equipment.

NOTE! Repeat steps a thru f, to close each half of Forward Calorimeter

3.0 Checklist -- Opening Forward Calorimeter

3.0.1 Person completing Checklist _____ Date _____
(Signature)

3.0.2 The following **MUST** be checked and confirmed before any moving operation is performed.

_____ Confirm that all cables connecting the (2) halves of the Forward Calorimeter are long enough for the move, or are disconnected.

_____ Confirm that Beam Pipe Support bracket is disconnected from one (1) half of the Forward Calorimeter.

_____ Confirm that swinging Electronics' Rack is in proper position.

_____ Confirm that Accelerator Division vacuum equipment is stored properly.

_____ Confirm that the CDF Collision Hall vacuum is isolated from Main Ring vacuum.

_____ Confirm that Beam-Beam counters are removed.

_____ Confirm that cabling running between Forward Calorimeter and the Central Detector has been removed.

_____ Confirm that the outriggers are properly stored.

_____ Confirm that all debris is removed from area of move.

3.1 Checklist -- Closing Forward Calorimeter

3.1.1 Person completing Checklist _____ Date _____
(Signature)

3.1.2 The following **MUST** be checked and confirmed before any moving operation is performed.

_____ Confirm that all cables connecting the (2) halves of the Forward Calorimeter are long enough for the move, or are disconnected.

_____ Confirm that Beam Pipe Support bracket is disconnected from one (1) half of the Forward Calorimeter.

_____ Confirm that swinging Electronics' Rack is in proper position.

_____ Confirm that Accelerator Division vacuum equipment is stored properly.

_____ Confirm that the CDF Collision Hall vacuum is isolated from Main Ring vacuum.

_____ Confirm that Beam-Beam counters are removed.

_____ Confirm that cabling running between Forward Calorimeter and the Central Detector has been removed.

_____ Confirm that the outriggers are properly stored.

_____ Confirm the "Z" location of the Forward Calorimeter with respect to Low Beta Quads.

_____ Station observers as necessary to check for equipment component interferences.

NOTE: Upper observers must wear safety harness.

_____ Confirm that all debris is removed from area of move.

4.0 Deviations from the Procedure

May be approved by the Responsible Engineer.

5.0 Required Training and Authorized Training Personnel.

5.0.1 To be an Authorized Instructor, the person must have several years experience in the rigging field. The person must be designated by the Responsible Engineer.

5.0.2 When an Authorized Instructor is present, the operation may declared to be a training session. No previous training is required by the other members of the team

5.0.3 To be a Co-Ordinator: the individual must have a number of years of experience in the rigging field or have been trained by the "Authorized Instructors," in this procedure. The qualifications of this individual are evaluated by the Responsible Engineer or Authorized Instructor.

5.0.4 To be a Task Leader: the individual must have a number of years of experience in the rigging field or have been trained by the "Authorized Instructor," in the procedure. The qualifications of this individual are evaluated by the Responsible Engineer or Authorized Instructor.

LIST OF RESPONSIBLE ENGINEERS FOR THIS PROCEDURE

Name GRIMSON, JOHN ID # 330.
Last, First

Name _____ ID # _____.
Last, First

Name _____ ID # _____.

Last, First

LIST OF AUTHORIZED INSTRUCTORS FOR THIS PROCEDURE

Name GRIMSON, JOHN ID # 330 .

Last, First

Name SHO VAN, ROBERT ID # 851 .

Last, First

Name ID # .

Last, First

Name _____ ID # _____
Last, First

6.0 Training Materials.

None at this time.

7.0 List of Trained People for this procedure.

The most current copy of this training list must be kept with the controlled copies of this movement procedure. The controlled copies are maintained in the CDF Department Office and the CDF (B-0) Office Complex, Room 171 i. If the trained individual's name is not on the controlled copy list, then that individual is NOT authorized to operate the specified equipment.

7.1 Authorized Co-Ordinators:

ALL AUTHORIZED INSTRUCTORS ARE AUTHORIZED CO-ORDINATORS

name, ID# _____ date _____ expires _____

signature: _____ . approved by: _____ .

name, ID# _____ date _____ expires _____

signature: _____ . approved by: _____ .

name, ID# _____ date _____ expires _____

signature: _____ . approved by: _____ .

name, ID# _____ date _____ expires _____

signature: _____ . approved by: _____ .

name, ID# _____ date _____ expires _____

signature: _____ . approved by: _____ .

name, ID# _____ date _____ expires _____

signature: _____ . approved by: _____ .

7.2 Task Leader:

name, ID# _____ date _____ expires _____
signature: _____ . approved by: _____ .

name, ID# _____ date _____ expires _____
signature: _____ . approved by: _____ .

name, ID# _____ date _____ expires _____
signature: _____ . approved by: _____ .

name, ID# _____ date _____ expires _____
signature: _____ . approved by: _____ .

name, ID# _____ date _____ expires _____
signature: _____ . approved by: _____ .

name, ID# _____ date _____ expires _____
signature: _____ . approved by: _____ .

name, ID# _____ date _____ expires _____
signature: _____ . approved by: _____ .

8.0 References and Supporting Documentation.

None at this time.